

CHILDREN'S ARITHMETIC.

BY THE REV. R. H. QUICK.

In a previous number of this *Review* (June, 1890), I endeavoured to add to some excellent suggestions previously made by Mrs. Hart-Davis on teaching arithmetic to children. I maintained that Grube's method of making children familiar with all the relations of numbers up to ten was the true method, and that these relations should be got at experimentally with cubes or counters. This foundation should be very carefully laid, and so long as the children are not bored it is hardly possible to advance too slowly. In settling these first ideas we are settling the groundwork of all knowledge of arithmetic.

Have we ever thought of the confusion and obscurity which teachers often introduce into children's minds instead of letting in the light of day? That this obscurity is in many cases directly due to the teacher was brought home to me by a conversation I lately had with a bright-eyed little chatterbox not quite eight years old, whom I overtook in the road during school hours, with a bag in one hand and some coppers in the other. Our talk was somewhat as follows:—

He.—Why are you not at school to-day?

She (timidly).—Please, mother wanted me to mind the baby and go of errands.

He.—What standard are you in?

She.—I'm in the first standard. So I was last year, but I didn't go on the day of the examination, so they wouldn't put me up.

He.—How do you get on with your reading?

She (timidity wearing off).—Oh, I get on very well with my reading! I read quite fast. There's my cousin, Annie, she's older than I am, and she can't read as fast as me. (*Then becoming melancholy*) But she can do her sums, and I can't.

He.—What sort of sums do you do?

She.—We do 'dition sums and 'straction sums.

He.—How do you do the addition sums?

She.—We put 'em down and add 'em up like. I can do the 'dition sums, but what I can't do is them distraction sums!

He.—Tell me about them.

She.—You have to put them down some at the top and some at the bottom, and then you have to take away the bottom from the top.

He.—Well, why can't you do that?

She.—Because sometimes you *can't* take 'em away, and then you have to *borrow*.

He.—What do you borrow?

She.—You borrow what you want, and then you have to pay it back again, and I can't do that.

So here was a poor child trying to see her way through the sophistries and absurdities the teacher had put before her, and driven to despair because she failed to do the impossible. I was among the audience when one of the ablest men of our day, the present Bishop of London, told a meeting how what seemed a very slight difficulty had for a time barred his progress in childhood. Our children have not on an average anything like the force of thought that he had, and many still smaller difficulties seem to them insurmountable. How important it is, then, that the teacher should watch the action of the child's mind, and try to understand and sympathise with its difficulties!

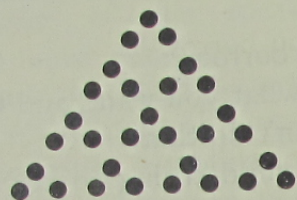
Addition of two numbers should be practised with counters, and when one of the numbers is 9, 8, or 7 the child should take from the other number as many as are necessary to turn the 9, 8, or 7 into 10. He will see at once what the sum will be. Say $8+5$ is required; the child is given 8 counters and 5 counters; he takes 2 from the 5, and seeing 3 left he pronounces the sum required to be "ten-three." In subtracting, the child should climb from the subtrahend to the minuend. If $9-3$ is required the child must think what must be added to 3 to make 9. If $13-9$ is wanted, the child must find what will with the 9 make 10, and then add that to the 3.

This plan of always making bundles of tens, and then thinking how many are over, is not at present much used in this country, but I venture to believe it *will* be used some day. At present it is worked in South Australia, where it has been introduced,

perhaps invented, by the Inspector General of Schools, Mr. J. A. Hartley.*

The grand principle of all is to let the child *find out things for himself*.

This may be applied to the multiplication table. First, let the child arrange in a column ten pairs of counters. From the column he runs over upwards and downwards the multiples of two. For the threes he may have a paper ruled in squares, and a coloured pencil, and he may construct a pyramid of threes thus :—



When the child has learnt either the Roman or Arabic symbols he can fill in the numbers 3, 6, 9, 12, &c., working from right to left, the bottom line being taken first. In this way the apex will be marked 30. A similar pyramid will give the multiples of 4 up to 40.

There is another way in which he may practise his multiples. As soon as he knows the Arabic notation let him write a column of figures from 1 onwards, and let him put the selected number and all its multiples up to ten times the number *in colours*.

Next, let him have a penny manuscript book for his "record book." Time him with the minute-hand of a watch, and see how many seconds it takes him to run up and down the multiples of each number. Let him enter the result in each case, and thus keep his "record." Whenever he "beats his record" there is a new entry with its date.

By such devices the interest of children is aroused and maintained. The way is, to make all truths clear by giving actual things to count with, and when any truth has been arrived at, then to make it a workable instrument by means of frequent use.

* See his "Teachers' Manual of Elementary Arithmetic," Adelaide, Leader, 1888.

ATHLETICS IN RELATION TO A LIBERAL EDUCATION.

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Wellington is reported to have said that Waterloo—and by implication his Peninsular victories also—was won on the playground at Eton; in other words, that the endurance, activity, and bodily strength which were important factors in gaining the most decisive battle of the Napoleonic campaigns were trained and developed at our public schools. Nor is Wellington the only successful general who has attached great importance to games as part of a liberal education; and, recently, regrets have been expressed that it is not easy to give candidates for commissions marks for efficiency in riding, cricket, polo, golf, and swimming. Not long ago a young officer, who had seen a good deal of service in Egypt, said to me that to be able to keep your cricket or football team well in hand was more important than to know a little more Latin and Greek, or to make a nearer approach to a perfectly straight line. No doubt he was right. War is a rough game; battles do not take place, we have the high authority of Bismarck for asserting, as the result of science, but rather of accident, and the victory rests with the stronger, the more daring, the more enduring. But life itself is a battle, and success in the conflict is not achieved by distinction in the schools, nor by an accurate acquaintance with particular authors, ancient or modern; true, the more learning a man has the better, but perseverance, energy, and dash count for much, perhaps more.

Nothing comparable to our public schools exists anywhere out of England. You may find scholars as ripe, with principles as high, but where else will you also find that persistent attention to the body which is the glory of our system? We, like